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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2259		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IL03/00127	International filing date (day/month/year) 18 February 2003 (18.02.2003)	Priority date (day/month/year) 20 February 2002 (20.02.2002)	
International Patent Classification (IPC) or national classification and IPC IPC(7): B23B 31/40, 31/06 and US Cl.: 279/2.03, 155			
Applicant SIEV, RAMI			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>5</u> sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of report with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application 			
Date of submission of the demand 09 September 2003 (09.09.2003)		Date of completion of this report 08 April 2004 (08.04.2004)	
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer Daniel W. Howell Telephone No. 703-308-1148 <i>Sheila H. Venev</i> Paralegal Specialist Tech. Center 3700	

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. _____

PCT/IL03/00127

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed.

☒ the description:

pages 1-17 _____ as originally filed

pages NONE _____, filed with the demand

pages NONE _____, filed with the letter of _____.

☒ the claims:

pages NONE _____, as originally filed

pages NONE _____, as amended (together with any statement) under Article 19

pages NONE _____, filed with the demand

pages 18-22 _____, filed with the letter of 12 March 2004 (12.03.2004)

☒ the drawings:

pages 1-7 _____, as originally filed

pages NONE _____, filed with the demand

pages NONE _____, filed with the letter of _____.

☐ the sequence listing part of the description:

pages NONE _____, as originally filed

pages NONE _____, filed with the demand

pages NONE _____, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☐ the description, pages NONE

☒ the claims, Nos. 8-14, 22-28

☐ the drawings, sheets/fig NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application no.
PCT/IL03/00127

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)

Claims 1-7, 15-21 YES
Claims NONE NO

Inventive Step (IS)

Claims 1-7, 15-21 YES
Claims NONE NO

Industrial Applicability (IA)

Claims 1-7, 15-21 YES
Claims NONE NO

2. CITATIONS AND EXPLANATIONS

Claims 1-7 and 15-21 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the spring between the plunger and collet of claims 1 and 15 and the spring biasing the plunger away from the collet of claims 1 and 15.

Claims 1-7 and 15-21 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

NEW CITATIONS

1. An internal surface chucking mechanism (ISM) comprising a coupling mechanism (103, 105, 107) activable for gripping and for release of a workpiece (W) in process on a processing machine, the workpiece defining an external surface and an internal surface configured for access from the outside, the processing machine comprising:

an inner chamber (70) defining an axis (A) and a volume of space inside the processing machine,

an external surface chucking mechanism (EXS) releasably and retrievably retained in axial alignment in the inner chamber and configured for gripping and for releasing an external surface of the workpiece in process on the processing machine, and

a push rod (7) operatively associated with the EXS to controllably command gripping and release of the external surface of the workpiece in process, whereby retrieval of the EXS from the inner chamber and insertion therein of the ISM in replacement, provides operation of the processing machine in a first configuration with an EXS, and in a second configuration with an ISM, and *vice versa*,

the ISM further comprises a bushing (101) defining a bushing outside and a bushing inside, the bushing outside being configured to be retrievably received in axial alignment inside the inner chamber (70), and the bushing inside being configured for receiving the coupling mechanism, and

the coupling mechanism comprises a collet (107) with jaw pads (183) on collet fingers (181) normally in retracted position, and extensible radially outward to grip the workpiece, a plunger (103) with a rod head (203), and a spring (105) biasing the plunger away from the collet, and the ISM is configured for insertion and retention in the inner chamber, and for retrieval therefrom, to provide reversible exchange in replacement of the EXS, in operative association with the push rod to activate the coupling mechanism, characterized in that:

forward translation of the push rod (7) against the plunger (103) urges the rod head (203) against the collet fingers (181) for the jaw pads to grip an inner

diameter of the workpiece, while biasing the spring between the plunger and the collet, and

backward translation of the push rod away from the plunger causes the spring to actively bias the plunger backward, and the jaw pads to retract radially inward, whereby the gripped workpiece is released.

2. The ISM according to Claim 1, further characterized in that the ISM is operable with a processing machine operating a process selected, alone and in combination, from the group of processes consisting of material removal, fastening, joining, surface treatment, and quality assurance.
3. The ISM according to Claim 1, further characterized in that the ISM is configured for operation both when rotative and when non-rotative.
4. The ISM according to Claim 1, further characterized in that the ISM is operable with a processing machine comprising a rotating spindle (3).
5. The ISM according to Claim 1, further characterized in that the ISM and the EXS are mutually and reversibly exchangeable *in situ*.
6. The ISM according to Claim 1, wherein the processing machine defines an initial external configuration when operating an EXS, and the ISM is further characterized in that exchange of the EXS with the ISM maintains unaltered the initial external configuration of the processing machine.

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7. The internal surface chucking mechanism (ISM) according to Claim 1, wherein:

the bushing (101) is configured for retention in the processing machine inside the spindle (3), which has an outside front threaded portion (9ST) accommodated for fastening a cap-nut (5) thereon, and the EMS is further characterized in that:

when the bushing is received in axial alignment inside the inner chamber (70), and the cap-nut is fastened to the spindle, axial relative translation between the bushing and the spindle is prevented.

15. A method for providing an internal surface chucking mechanism (ISM) comprising a coupling mechanism (103, 105, 107) activable for gripping and for release of a workpiece (W) in process on a processing machine, the workpiece defining an external surface and an internal surface configured for access from the outside,

the processing machine comprising:

an inner chamber (70) defining an axis and a volume of space inside the processing machine,

an external surface chucking mechanism (EXS) releasably and retrievably retained in axial alignment in the inner chamber and configured for gripping and for releasing the external surface of the workpiece in process on the processing machine, and

a push rod (7) operatively associated with the EXS to controllably command gripping and release of the external surface of the workpiece in process, whereby retrieval of the EXS from the inner chamber and insertion therein of the IMS in replacement, provides operation of the processing machine in a first configuration with an EXS, and in a second configuration with an ISM, and *vice versa*,

the ISM further comprises a bushing (101) defining a bushing outside and a bushing inside, the bushing outside being configured to be retrievably received in axial alignment inside the inner chamber (70), and the bushing inside being configured for receiving the coupling mechanism, and

the coupling mechanism comprises a collet (107) with jaw pads (183) on collet fingers (181) normally in retracted position, and extensible radially outward to grip the workpiece, a plunger (103) with a rod head (203), and a spring (105) biasing the plunger away from the collet, and the ISM is configured for insertion and retention in the inner chamber, and for retrieval therefrom, to provide reversible exchange in replacement of the EXS, for operative association with the push rod to activate the coupling mechanism, characterized by the steps of:

translating the push rod (7) forward against the plunger (103) for urging the rod head (203) against the collet fingers for the jaw pads to grip an inner diameter of the workpiece, while biasing the spring between the plunger and the collet, and

translating the push rod backward away from the plunger, causing the spring to actively bias the plunger backward, and for the jaw pads to retract radially inward, whereby the gripped workpiece is released.

16. The method according to Claim 15, further characterized by:

operating the ISM with a processing machine running a process selected, alone and in combination, from the group of processes consisting of material removal, fastening, joining, surface treatment, and quality assurance.

17. The method according to Claim 15, further characterized by:

configuring the ISM for operation both when rotative and when non-rotative.

18. The method according to Claim 15, further characterized by:

operating the ISM with a processing machine comprising a rotating spindle
(3).

19. The method according to Claim 15, further characterized by:

replacing the ISM with the EXS in situ, in mutual and reversible exchange.

20. The method according to Claim 15, wherein

the processing machine defines an initial external configuration when operating an EXS, and

the method is further characterized by:

maintaining the initial external configuration of the processing machine unaltered after exchange of the EXS with the ISM.

21. The method according to Claim 15, wherein:

the bushing (101) is configured for retention in the processing machine inside the spindle (3), which has an outside front threaded portion (9ST) accommodated for fastening a cap-nut (5) thereon, and
further characterized in that:

when the bushing is received in axial alignment inside the inner chamber (70), and the cap-nut is fastened to the spindle, axial relative translation between the bushing and the spindle is prevented.